



1999 Coastal Resource Management Customer Survey Summary of Results

Background

General Survey Background

The Coastal Resource Management Customer Survey was sent to a total of 270 offices representing state resource protection agencies, coastal zone management (CZM) programs, Sea Grant programs, National Estuary Programs (NEP), National Estuarine Research Reserves (NERR), and National Marine Sanctuaries (NMS). Delivered in two parts to the office director, part one, which addressed spatial data use and needs and technical capabilities, was to be completed by the information manager, and part two, which addressed resource management roles and approaches and education and training needs, was to be completed by the program manager. Over 70 percent of the respondents completed the survey, capturing general trends in information and resource management of the coastal management community.

Reading the Results

The total number of respondents (N) for part one and part two are 131 and 158, respectively. The percentages reported for each question are, unless otherwise noted, computed using the total respondents for the respective survey part (one or two). In certain cases (i.e., those noted) it was necessary, to make relevant comparisons, to compute percentages based on respondents whose agency functions fell within the applicable responses. In other words, in these cases, percentages are computed after subtracting the no responses and "not applicable" responses.

Additionally, some tables display the data organized by agency type or geographic region. The regional classification of coastal states is as follows:

- **Northeast (NE):** Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Rhode Island, and Virginia
- **Southeast and Gulf of Mexico (SE):** Alabama, Georgia, Florida, Louisiana, Mississippi, North Carolina, South Carolina, and Texas
- **West:** Alaska, California, Oregon, and Washington
- **Great Lakes:** Indiana, Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin
- **Islands:** American Samoa, Commonwealth of the Northern Marianas Islands (CNMI), Guam, Hawaii, Puerto Rico, and U.S. Virgin Islands

Respondents for part one and two with agency and regional breakdown

	Part One	Part Two
Total survey population	131	158
<i>Agency Types</i>		
NERR	17	16
NEP	11	14
NMS	4	8
CZM	28	30
State	60	72
SeaGrant	11	18
<i>Regions</i>		
West	24	25
Great Lakes	20	22
Islands	15	18
Northeast	46	60
Southeast	41	45

Note that in most cases, respondents were asked to select all answers that apply. As a result, some tables may look confusing if the sum of the columns does not add up to 100. Simply recall that respondents often selected more than one answer to each question.

Results

Key Points

- 88% and 44% of respondents use geographic information systems (GIS) and remote sensing applications, respectively.
- Only 2% of respondents lack access to GIS and 13% to remote sensing.
- 81% of respondents use ArcView® software for GIS.
- 53% of respondents create their own metadata, 37% use Federal Geographic Data Committee (FGDC) standards, and 64% are interested in or want more information about establishing their own FGDC node.
- Spatial data are used more to address habitat issues (61%) than they are to address any other issue. Habitat uses include habitat mapping, monitoring habitat status or health, and managing protected areas.
- The top three spatial data needs reported include nearshore bathymetry, high-resolution aerial photography, and fish distributions.
- In using management techniques to address coastal issues, agencies generally take a lead role in public outreach and education programs (53%), a coordinating role in GIS activities (51%), and an independent role in land use planning (18%).
- Approaches most often used to manage coastal resources are interagency coordination (79%) and public education (65%).

- The top information or technical resource that respondents found to be highly beneficial is resource inventory and assessment (53%).
- The top non-technical resource or improvement reported to be highly beneficial is funding for research or data collection (72%).
- Interest in training courses increases greatly if available either locally or via the Internet or other distance education technology.

Part One - Technology Applications to Coastal Management

Technical Capabilities

Special Purpose Software Use and Access

Respondents were asked to report which special purpose software their office uses to manage, analyze, or present spatial data.

Special purpose software use

Software Type	%
GIS	88
Database	63
Remote sensing	44
Visualization	40
Environmental process modeling	35
CAD	24
Decision-support/analysis	12

With regard to access to special purpose software, only 2% and 13% of respondents lacked access to GIS and remote sensing, respectively. The most common channels for alternate access to these two software applications were partnerships with academic institutions (8% for GIS and 24% for remote sensing) and other local, state, or federal agencies (15% for GIS and 18% for remote sensing).

GIS Capability Profile

In this series of questions, respondents were asked about various aspects of their office's GIS capabilities including expertise, number of staff who regularly use GIS, and software in use.

Staff level of GIS expertise

Level of expertise	%
No Expertise	15
Beginning	40
Intermediate	44
Advanced	33

Staff level of GIS expertise reported by agency type

Level of Expertise	NERR %	NEP %	NMS %	CZM %	State %	Sea Grant %
No Expertise	0	27	25	21	12	27
Beginning	65	55	25	43	33	18
Intermediate	41	45	25	57	45	45
Advanced	12	9	25	46	42	36

Number of staff per office who regularly use GIS and are trained in GIS

Number of staff per office	Regularly use GIS %	Trained in GIS %
0	14	12
1-2	39	45
3-5	18	17
6-10	10	11
Over 10	15	11

The most commonly used GIS software applications reported were ArcView® (81%) and ARC/INFO® (60%). Imagine® (18%) and MapObjects® (11%) were also used.

The following table displays the response to the question, "What portion of GIS use in your office - none, some, or most - targets the following activities?"

"Most" / "some" of GIS use targeted by agency GIS activities

GIS Activities	% ranked most/some of use					
	NERR	NEP	NMS	CZM	State	Sea Grant
General and project specific mapping	65 / 24	64 / 18	0 / 50	68 / 32	58 / 35	27 / 36
Information management tool for spatial analysis	6 / 41	0 / 82	0 / 50	21 / 61	23 / 60	0 / 64
Tool for static modeling in spatial context	0 / 35	9 / 45	0 / 50	0 / 36	8 / 40	0 / 55
Supplying "state" of the system data sets to dynamic environmental process models	6 / 0	0 / 27	0 / 0	0 / 32	0 / 33	0 / 36

Remote Sensing Capability Profile

The following three tables display results from the series of questions that asked respondents to describe remote sensing use in their office.

Staff level of remote sensing expertise

Level of Expertise	%
No Expertise	45
Beginning	23
Intermediate	23
Advanced	10

Staff level of remote sensing expertise reported by agency type

Level of Expertise	NERR %	NEP %	NMS %	CZM %	State %	Sea Grant %
No Expertise	65	73	25	36	42	36
Beginning	24	18	25	32	22	9
Intermediate	12	18	25	11	32	27
Advanced	0	9	0	14	8	27

Number of staff per office who regularly use remote sensing and are trained in remote sensing

Number of staff per office	Regularly use remote sensing %	Trained in remote sensing %
0	14	12
1-2	39	45
3-5	18	17
6-10	10	11
Over 10	15	11

The most commonly used remote sensing software applications reported were ERDAS Imagine® (20%) and Image Analyst® (13%).

Metadata

In this section, respondents were asked about the use of metadata, information about the development of spatial data, in their office.

Metadata format used

Metadata Format	%
Do not create	47*
FGDC	37
State Standard	12
Academic institution standard	5

* Includes 10% "no response."

Interest in establishing an FGDC node for agency metadata holdings

Interest	%
Need more information	58
Would NOT like to establish	17
Already have an FGDC node	12
Would like to establish	6

Internet

Clients reported their office's access to the Internet and the type of browser used to view the Web.

Internet access

Response	%
Yes	100
No	0

Web browser used

Web Browser Type	%
Microsoft Internet Explorer®	41
Netscape Navigator®	51
Lynx®	0

Data Exchange

This question asked respondents which media type(s) their office prefers to use to exchange data.

Media used to exchange data

Media Type	%
CD	67
FTP	65
Zip	61
3 ½" disk	58
HTTP	45
Jaz disk	17
8mm tape	17
4-mm tape	8

Environmental Models

In addition to remote sensing and GIS, some agencies use environmental models to aid in the management of coastal resources. The following table lists the percent of respondents using certain models—the general type of model is in parentheses.

Environmental models used by at least 5% of respondents

Model (type)	%
BASINS (water quality)	15
HEC-x (hydrologic)	11
SWMM (hydrologic)	9
HSPF (hydrologic)	8
QUAL2EU (water quality)	8
WASP (water quality)	8
SLOSH (coast hazard)	5

Spatial Data

Use of Spatial Data for Broad Coastal Issue Types

Resource management offices were asked if and how they use spatial data for a variety of specific coastal issues broadly categorized as habitat, water quality, coastal development, hazard, and resource management (including human uses) issues. If an agency used spatial data for an issue, they were also asked whether the data was collected or derived by their office; collected, derived, and managed by others; or managed within a GIS. The following table reports the percentage of spatial data use (regardless of how it was acquired) and how much of it is managed within a GIS—indicating the level of investment the offices contribute to GIS.

Use of spatial data for broad coastal issues

Broad Issue Category	% that use data	% that manage data in a GIS
Habitat	61	33
Resource management	50	20
Coastal development	44	17
Water quality	42	14
Coastal hazards	40	17

Use of Spatial Data for Specific Coastal Issues

Spatial data use for specific coastal issues varies for many reasons including technical capability, ease of access and application, geographical location, and issue prioritization. The responses provide some insight into the level of sophistication of GIS and spatial data use. The ability to collect and derive spatial data indicates a greater technical sophistication and an increased level of investment in its use and infrastructure. Management of spatial data within a GIS framework indicates the development of decision support tools around issues that are either a high priority or are those easiest for which to develop GIS applications.

The following table lists the top three specific coastal issues, per broad issue type, managed within a GIS. For each issue listed, the table displays the percent of all offices that manage that issue in a GIS, as well as the percent of offices using spatial data for each issue that manage it in a GIS.

Top three specific issues, per broad issue category, that are managed in a GIS

Issue "Managed in a GIS"	% of all respondents	% of respondents who use spatial data for the issue
Habitat		
Habitat mapping	48	61
Habitat status or health	37	56
Protected areas management	35	56
Resource management		
Watershed management planning	37	51
Protected or endangered species	28	45
Surface waters	26	44

Issue "Managed in a GIS" (cont'd)	% of all respondents	% of respondents who use spatial data for the issue
Coastal development		
Land use or changes in land use	26	39
Dredging or port issues	18	41
Public access to the coast	18	40
Water quality		
Point source pollution	21	39
Non-point source pollution	21	35
Harmful algal blooms or Pfiesteria	8	31
Coastal hazards		
Coastal erosion or accretion	23	45
Oil spill planning or response	20	46
HAZMAT spill planning or response	15	40

Spatial Data Needs

Respondents were asked to indicate the usefulness - very, moderately, minimally, not useful, and already have data - of a variety of types of spatial data sets.

Top 10 of 29 data sets ranked "very useful" by all respondents

Data Set	%
Nearshore bathymetry	58
High resolution aerial photography	58
Fish distribution	57
Estuarine and bay bathymetry	55
Coastal land cover and change	55
Wetland function	55
Shoreline erosion or accretion rates	53
Habitat suitability indices	53
Shoreline	52
Coastal topography	52

Top two spatial data types ranked "very useful" by region

Spatial Data Type	%
West	
Fish distributions	67
Nearshore bathymetry	58
Great Lakes	
Shoreline erosion or accretion rates	60
High resolution aerial photography	60
Islands	
Shoreline erosion or accretion rates	50
Coral distribution maps	47
Northeast	
Shellfish bed distribution maps	50

Fish distributions	49
Spatial Data Type (con't)	%
Southeast	
Estuarine and bay bathymetry	63
Coastal land cover and change maps	63

Part 2 - Coastal Management Activities and Training Needs

Management Activities

Role in Addressing General Coastal Issues

In this first question of part two, we asked respondents to indicate their offices' role—none, lead, coordinating, or independent—in addressing the coastal issues listed in the part one question concerning spatial data use.

Role of all respondents in addressing coastal issues categories

Broad Issue Category	%			
	Not applicable	Lead	Coordinating	Independent
Habitat	17	24	42	19
Resource management	21	18	39	17
Coastal development	20	14	42	14
Water quality	24	13	39	23
Coastal hazards	25	12	34	24

Approach to Managing Coastal Habitats

To further understand the types of management approaches being used, respondents were asked to indicate the approach(es) they use to manage a variety of specific coastal habitats. The percentages in the following tables are calculated from respondents who reported using at least one of the approaches to manage a habitat, rather than from all survey respondents.

Approach(es) used to manage coastal habitats

Management Approach	% *
Interagency coordination	79
Public education	65
Permit actions	38
Restoration	37
Land use planning	29

* Percent of those respondents who reported using at least one approach to manage a resource, averaged across all resources.

Agency approach to managing coastal habitats

Management Approach	Agency % **					
	NERR	NEP	NMS	CZM	State	Sea Grant
Interagency coordination	78	94	94	86	84	24
Public education	92	80	79	73	44	100
Permit actions	18	1	62	56	52	0
Restoration	54	64	54	33	36	9
Land use planning	39	44	25	50	18	9

*** Percent of those respondents who reported using at least one approach to manage the specific resource.*

Top two coastal habitats managed via each approach

Management Approach	% ***
Interagency coordination	
Coastal waters	86
Shellfish habitat	83
Public education	
Estuarine waters	76
Coastal waters	75
Permit Actions	
Coral reefs	50
Coastal waters	47
Restoration	
Tidal wetlands - marsh	50
Estuarine waters	49
Land Use Planning	
Freshwater wetlands	36
Upland forests	36

**** Percent of those respondents who reported using at least one approach to manage the specific resource.*

Education and Volunteer Programs

In this next set of questions, clients were asked to respond to questions concerning education and volunteer programs in their offices and the target audiences.

Use of educational and volunteer programs to accomplish goals

Agency Activity	% Yes	% No
Develops educational curricula or programs	59	38
Operates volunteer programs	54	45

Use of educational and volunteer programs to accomplish goals by agency

Agency Activity	Agency % Yes					
	NERR	NEP	NMS	CZM	State	Sea Grant
Develops educational curricula or programs	94	71	88	57	38	94
Operates volunteer programs	94	81	88	37	42	67

Target audience(s) of education and outreach programs

Audience	% [†]
General public	98
Local government	91
State legislature	78
Resource managers	78
Teachers	72
Businesses	70
State executive branch a/o governor's office	67
Grades K -8	66
Grades 9-12	66

[†] Percent of those with program responsibility (n = 137)

Resource, Information and Improvement Wants

Technical and Non-Technical Resources

We asked all respondents to indicate the benefit—none, low, medium, high—their office would expect to receive from a variety of technical and non-technical resources, information, or improvements.

Top five information or technical resources ranked "highly beneficial"

Technical Resource	%
Resource inventory and assessment	53
Enhanced ability to interpret and apply spatial data for decision making	46
Environmental monitoring technologies	45
GIS	43
Mapping capability	38

Top five non-technical resources or improvements ranked "highly beneficial"

Non-technical Resource	%
Funding for research or data collection	72
Additional human resources	68
Funding for demonstration/pilot projects	68
Funding for outreach initiatives	59
Greater public support	55

Training Interests

Technology and Non-Technical Training

In this section of the survey, respondents were asked to indicate their interest in having staff participate in technology and non-technical training subjects.

Top five technical training subjects desired by all respondents

Technology Training Subject	% Yes	% No	% Only if locally available
ArcView GIS	44	12	31
Image processing techniques	44	21	21
Introduction to coastal remote sensing	43	16	30
Avenue programming for ArcView GIS	38	18	26
Interpretation of aerial photography	38	21	25

Technical training subjects desired by agency

Non-technical Training Subject	Agency % Yes ^{††}					
	NERR	NEP	NMS	CZM	State	Sea Grant
ArcView GIS	65	64	75	50	32	27
Image processing techniques	71	45	50	57	28	45
Introduction to coastal remote sensing	76	55	50	61	23	36
Avenue programming for ArcView GIS	47	27	50	46	37	18
Interpretation of aerial photography	71	36	25	50	27	27
Information management technologies for coastal executives	29	55	75	57	23	36
Interpretation of aerial photography	71	36	25	50	27	27

^{††} *Bolded percentages indicate top two subjects (based on % yes) for each agency.*

Non-technical training subjects

Non-technical Training Subject	% Yes	% No	% Only if locally available
Research methods for coastal management	45	28	23
Developing management plans	45	30	25
Public outreach plans	42	23	32
Conflict resolution	39	26	34
Public involvement processes	37	22	39
Developing communication plans	32	29	37
Introduction to coastal zone management ^{†††}	16	26	22

^{†††} *Responses are underreported due to an error in the electronic version of the survey.*

Non-technical training subjects desired by agency

Non-technical Training Subject	Agency % Yes					
	NERR	NEP	NMS	CZM	State	Sea Grant
Research methods for coastal management	75	43	50	57	33	44
Developing management plans	38	21	100	70	38	33
Public outreach plans	56	43	75	70	22	44
Conflict resolution	50	43	75	37	29	50
Public involvement processes	44	43	88	47	24	39
Developing communication plans	38	50	75	47	18	28
Introduction to coastal zone management ^{†††}	25	0	13	7	21	17

^{†††} Responses are underreported due to an error in the electronic version of the survey.

Interest in training subjects if delivered via Internet or distance education technology

	Would increase	Would decrease
Interest	65%	13%

Summary

The complete survey report will be mailed to all 270 respondents when printed. Continue to visit the NOAA Coastal Services Center's Web site to view the full version of this report once posted. Results from this survey will be used to guide the Center's annual and future project planning. The Center will also be sharing this information with its NOAA partners so the entire agency can benefit from the information. Although surveys do require a time commitment to complete, they do provide government agencies the information necessary to develop appropriate and needed programs. Participation in this process is greatly appreciated. This information was collected in compliance with the Paperwork Reduction Act (OMB Control Number: 0648-0308, Expires May 31, 2002).